

FORAGE SUITABILITY GROUP

Claypan

FSG No.: G055CY800SD

Major Land Resource Area: 55C - Southern Black Glaciated Plains

Physiographic Features

These soils are found on plane to concave surfaces on upland till plains and footslopes, and in low-lying flats on outwash plains and terraces and in basins.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1300	1970
Slope (percent):	0	6
Flooding:		
Frequency:	None	Rare
Duration:	None	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	High

Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 55C. Average annual precipitation for all climate stations listed below is about 21 inches. About 75 percent of that occurs during the months of April through September. On average, there are about 28 days with greater than .1 inches of precipitation during the same timeframe. Annual precipitation and temperature increase from the north to the south in the MLRA.

Average annual snowfall ranges from 23 inches at Pickstown to 41 inches at Huron. Snow cover at depths greater than 1 inch range from 32 days at Howard to 72 days at Huron.

Average July temperatures are about 75°F and average January temperatures are about 16°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -39 at both Mellette and Huron, and a high of 114 recorded at Mellette. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b, with a small area of warmer 5a along the Missouri River.

At Huron, the average annual wind speeds are about 11.5 mph. The highest wind speeds occur during March through May. It is cloudy about 154 days a year. Average morning relative humidity in June is about 86 percent and average afternoon humidity is 59 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at <http://www.wcc.nrcs.usda.gov>.

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	128	161
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 19	May 07
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 31	May 18

First Frost in Fall (32 deg): (1 year in 10 earlier than)	From Sep 08	To Sep 23
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Sep 16	Oct 04
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	105	136
Growing Degree Days (40 deg):	4360	5304
Growing Degree Days (50 deg):	2763	3192
Annual Minimum Temperature:	-30	-20
Mean annual precipitation (inches):	18	22

Monthly precipitation (inches) and temperature (F):

2 years in 10:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip. Less Than	0.12	0.18	0.36	0.85	1.28	1.35	1.40	0.94	0.52	0.43	0.18	0.20
Precip. More Than	0.93	1.28	2.56	3.74	5.15	5.28	4.68	3.53	4.20	2.68	1.90	1.38
Monthly Average:	0.44	0.61	1.48	2.32	3.11	3.56	2.72	2.27	2.10	1.47	0.80	0.56
Temp. Min.	-1.5	4.9	18.8	31.6	43.3	53.4	58.8	55.4	44.1	32.5	18.7	4.1
Temp. Max.	30.6	36.4	47.0	62.4	73.4	83.0	90.4	88.6	78.2	65.5	46.7	33.4
Temp. Avg.	15.8	21.8	33.4	47.8	59.3	69.0	75.2	72.9	62.3	50.2	33.9	17.7

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD0043	Academy, SD	1961	1990
SD4037	Howard, SD	1961	1990
SD4127	Huron, SD	1961	1990
SD5456	Mellette, SD	1961	1990
SD5561	Miller, SD	1961	1990
SD6574	Pickstown, SD	1961	1990
SD7052	Redfield, SD	1961	1990
SD8767	Wagner, SD	1961	1990

Soil Interpretations

This group consists of somewhat poorly and moderately well drained, medium to moderately coarse textured soils formed from glacial till and glacial outwash sediments. They have Claypan subsoils with slow permeability. The underlying material and lower part of the subsoil typically have high amounts of soluble salts and are alkaline.

Drainage Class:	Somewhat poorly drained	To	Moderately well drained
Permeability Class: (0 - 40 inches)	Slow	To	Slow
Frost Action Class:	Low	To	High

	<u>Minimum</u>	<u>Maximum</u>
Depth:	72	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	1.0	4.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	8	16
Sodium Absorption Ratio: (0 - 12 inches)	5	20
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.1	7.8

	<u>Minimum</u>	<u>Maximum</u>
Available Water Capacity (inches): (0 - 60 inches)	2	10
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	8

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed at <http://plants.usda.gov/>.

Cool Season Grasses

Beardless wildrye	F
Crested wheatgrass	F
Green needlegrass	F
Intermediate wheatgrass	F
Newhy hybrid wheatgrass	F
Pubescent wheatgrass	F
Russian wildrye	F
Slender wheatgrass	F
Smooth brome grass	F
Tall wheatgrass	G
Western wheatgrass	G

Legumes

Alfalfa	F
Sweetclover	F

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields, and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop

	Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	5100	2600
Alfalfa/Crested wheatgrass	4000	2100
Alfalfa/Intermediate wheatgrass	4200	2300
Crested wheatgrass	3700	1800
Intermediate wheatgrass	3900	1800
Tall wheatgrass	3900	1800
Western wheatgrass	2600	1300

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: SD0001
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa, MLRA's 107, 102B, 63B, 66, 65

Percent Production by Month											
<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	30	25	20	15	5	0	0	0

Growth Curve Number: SD0004
Growth Curve Name: Cool season grass
Growth Curve Description: Cool season grass, statewide

Percent Production by Month											
<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	10	40	30	10	5	5	0	0	0

Soil Limitations

These soils have severe limitations to the production of climatically adapted forage species. The Claypan and the soluble salts and sodicity in the subsoil produce an unfavorable rooting environment, limiting species selection and production potential.

Management Interpretations

The impact on yields can be reduced by selecting forage species that are tolerant of salinity and sodicity and can root in dense, clayey subsoils.

FSG Documentation

Similar FSG's:

<u>FSG ID</u>	<u>FSG Narrative</u>
G055CY210S	Clayey subsoils are less saline and/or sodic and have a more favorable rooting zone.

Inventory Data References

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone maps
National Soil Survey Information System (NASIS) for soil surveys in South Dakota counties in MLRA 55C
NRCS South Dakota Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation

This site has been correlated with the following states: South Dakota

Forage Suitability Group Approval

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